reverted impervious areas should not be included here. revise number for all new impervious areas.

Project Title: HWY SR 523 - MP 0.78 to 1.11 WSDOT Region: WIN:

PIN(s):

Design Manual Used: Highway Runoff Manual

Manual Publication Year: 2019

Job Number: Refer to HRM Figure 3-3 Step 8 Are the replaced Impervious surfaces applicable to the project per HRM Figure 3-1 Step 4?

NO

Are there any existing flow control stormwater BMPs within the project limits?

NO

2019 HRM Spreadsheet Version 6.3 YES Is this project in western Washington?

Does the project have retrofit requirements for discharges to Puget Sound?

TDA Description	Description	Impervious Imp Surface Su	everted Net-Net pervious Impervio urface** Surface rea (ft ²) Area (ft ²)	us Impervious Surface	Non- Effective Impervious Surface Area (ft ²)	Effective Impervious Surface Area (ft ²)	Conversion of Native Vegetation to Lawn or Landscape per TDA Area (ft ²)	Increase of 0.15 cfs in 100-year Recurrence Interval Flow for TDA?*** (Yes/No)	FC Needed for TDA based on Effective Impervious surface threshold? (Yes/No)	FC needed for TDA based on Native Vegetation Conversion? (Yes/No)	FC needed for TDA based on 0.15 cfs increase in flow? (Yes/No)	FC needed for TDA? Effective Impervious Area (ft²)	FC needed for TDA? Converted Pervious Surfaces Area (ft ²)	Comments
1	West Side of I-5, Sub-basins 1A, 1B, and 2		24,367 5,689	73,965	0	5,689	0	YES	NO	NO	YES	5,689	0	
2	East Side of I-5, Sub-basins 3A and 3B	16,851	1 2,375 4,476	88,843	0	4,476	0	YES	NO	NO	YES	4,476	0	
	4		•											
	<u> </u>													
	 	<u> </u>												
	 													
	/													
	update for 3c, 3d, & 3e	should be zero	0											
		Is for Project 46,907 3	36,742 10,165	162,808	0	10,165	0					10,165	0	

^{*} Input zero into this column if the reverted impervious surface does not meet the reversion requirements per HRM 4-3.5.3.

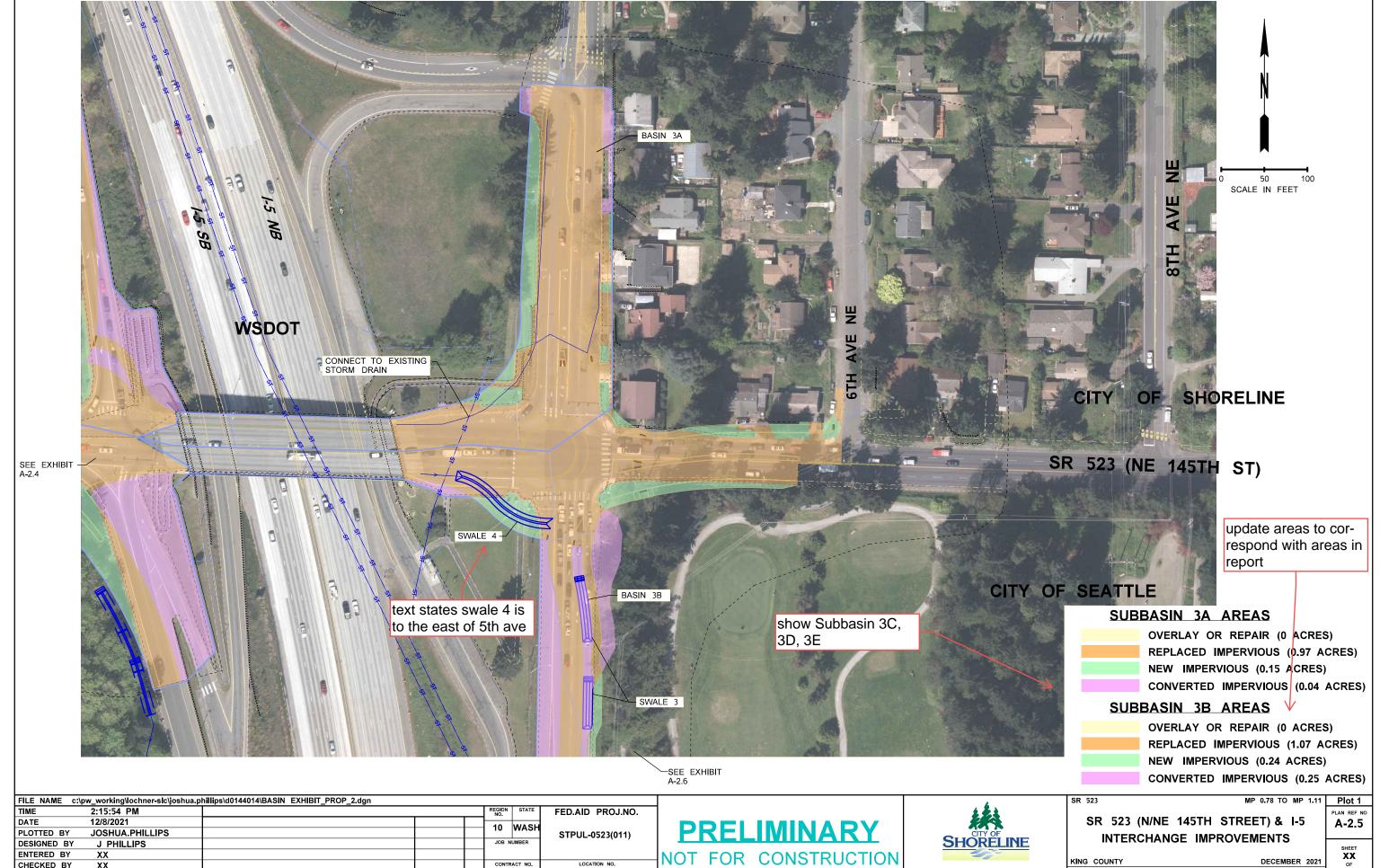
***See Highway Runoff Manual 3-3.6.3 for MGSFlood modeling guidance.

SDDS Worksheet.xlsx 9/16/2021 1:49 PM Version 6.2

Project Title:	HWY SR 523 - MP 0.78 to 1.11	
WSDOT Region:		
CN WIN:		
PIN:		
Design Manual Used: I	Highway Runoff Manual	
Manual Publication Year: 2	2019	
Job Number:		
CN Contract Number:		
SubstantiallyCompleteOperationallyComplete Date:		
CNPhaseEndPlanned Date:		
CNPhaseEndActual Date:		
Is the project within the WSDOT NPDES permit area?		
CN PE:		
_		

														2019 HRM	Spreadsheet Version	6.3				
									Is this an						List the amount of			f retrofitting existing impervious surfaces, list the	If retrofitting existing PGIS, list the	
		Begin	Begin		End	End			existing BMP to be modified by		Will this BMP be	List the old WSDOT Feature Number*** (existing BMPs that will	List the new WSDOT Feature Number*** (existing BMPs that will	I Is this BMP	Effective Impervious Surface (flow control) mitigated by	Effective	PGIS i	amount of existing impervious surface nitigated by the new	amount of existing PGIS mitigated by the new or modified	
State		Latitude** (in Decimal Degrees)	Longitude** (in Decimal Degrees)	End MP	Latitude** (in Decimal Degrees)	Longitude** (in Decimal Degrees)	TDA Name	Stormwater BMP Type	project or is this a new BMP?	owned and	maintained		be modified by the project will be given a	designed to full or partial HRM	the new or modified BMP (Acres)	mitigated by or modifie (Acre	the new of BMP	or modified BMP for flow control (Acres)	BMP for runoff treatment (Acres)	Comments
523		Dog. ccc)	Dog.coc)	001.11	Dog.occ)	Dog.coc)	1	CAVFS	New	YES	YES	now i outare reamber)	now routero reambor)	Full	0.000		0.690	(710100)	(710100)	Communic
	000.78			001.11			2	CAVFS	New	YES	YES			Full	0.000		0.390			
														This is	s greater tha	n				
														exces	PGIS. Confires amount is and list in it column.	111				
									+											
																				_

SDDS Worksheet.xlsx



LOCATION NO. CHECKED BY CONTRACT NO PROJ. ENGR. J TUTTLE XXXXXX

DATE

REVISION

REGIONAL ADM. M COTTEN

NOT FOR CONSTRUCTION



DECEMBER 2021 PROPOSED BASIN EXHIBIT 2

Fill in the data for the grey shaded areas only

145th Right Side - 2% Gutter Pan Slope

Tc = 5.00 C = 0.90 I = 2.39 m= 5.62 Project Name: SR 523 & I-5 INTERCHANGE IMPROVEMENTS
Project #: 16242
S.R.: 523
Designed By: JP
Date: 1/5/2021

															,														itional structure ded to reduce Zd	
Structure ID	Station	Distance Wid		Δ Q cfs (cfs)	ΣQ (cfs)	Slope L (ft/ft)	Super T (ft/ft)	Grate Type	HM Figure 5-1	11	GRATE WIDTH (ft)	GRATE LENGTH (ft) Roadway Classifica	tion Enter Requested Informati	n	Allowable Spread Polic	Dri La sy Wid	ving Shoulde ane Width th (ft) (ft)	Allowable Zd (ft)	Calculated Z _d (ft) d	Depth of Flow at Face of Curb Pavern (inches)	g'a Valasity E	of splash-over velocity tter v 5 (ft/sec)	ed to Full In Frontal Flow S R _f	ide Flow tercepted to Total ide Flow R _s	ency Grate Q _i E (cfs)	Q _{bp} (cfs)	Z _d Chec∤.	Q _{bp} Check	Comments (L/R)	
	16+60.00	295.30				0.000	0.000 -	 dard Plan B-30.30-				0.00 1.1 - 1.1 Division 1	Minor Enter Speed (mph)		5 Shoulder + 2 feet		12.00 0.0			0.84 0		0.83 4.60		0.07	0.84 0.3		Need to			
ь	19+55.30		3.50									Arterial, or Divided															Decrease Zd		Existing CB location. Outside limited access area.	
7	20+83.60	128.30	1 69	0.1	9 0.26	6 0.099		dard Plan B-40.40- es for Grate Inlet)2 Frame and Dua	al Vaned	1.75	 Interstate, Principal, N Arterial, or Divided 	Minor Enter Speed (mph)	-> 25	5 Shoulder + 2 feet		12.00 0.0	0 2.00	2.85	0.68 0	016 3.21	0.92 4.75	1.00	0.23	0.94 0.2	25 0.02	Need to Decrease Zd		Outside limited access area.	
8	20100.00	66.40	5.00	0.1	0.12	2 0.099		dard Plan B-30.30-	3 Rectangular Va	ned Grate	1.67	2.00 Roundabouts	Applicable to all speeds, Lear	е	Maintain at least 10 feet of coldriving lane that is free of water	ntinuous	13.81 0.0	0 3.81	2.13	0.51 0	016 2.64	0.98 4.60	1.00	0.10	0.98 0.1	12 0.00	Zd Allowable > Zd Design		Outside infliced access area.	
Q	21+50.00	50.10 50.10	1.93	0.0	8 0.00	0 0.097	0.020 Stand	dard Plan B-30.30-	13 Rectangular Va	ined Grate	1.67	2.00 Roundabouts	Applicable to all speeds, Lea		Maintain at least 10 feet of co	ntinuous	15.61 0.0	0 5.61	1.88	0.45 0	016 2.40	1.00 4.60	1.00	0.12	1.00 0.0	0 0 00	7d Allowable >			
9	22+00.10		3.64	0.0	0.00	0.037	0.020 Stand	Jai u Fiaii B-30.30-	os nectaligulai va	ineu Grate	1.07	2.00 Noundabouts	Blank>		driving lane that is free of water	er	13.01	3.01	1.00	0.45	2.40	1.00 4.00	1.00	0.12	1.00 0.0	0.00	Zd Design			
10		90.90		0.1	9 0.19	9 0.056	0.020 Stand	dard Plan B-30.30-	3 Rectangular Va	ined Grate	1.67	2.00 Roundabouts	Applicable to all speeds, Leave Blank	Э	Maintain at least 10 feet of condriving lane that is free of water		14.80 0.0	0 4.80	2.84	0.68 0	016 2.40	0.91 4.60	1.00	0.12	0.92 0.1	18 0.02	Zd Allowable > Zd Design			
12	13+56.40	106.00	3.04	0.1	1 0.13	3 0.034	0.020 Stand	dard Plan B-30.30-	3 Rectangular Va	ned Grate	1.67	2.00 Roundabouts	Applicable to all speeds, Lea	9	Maintain at least 10 feet of co	ntinuous	13.22 0.0	0 3.22	2.68	0.64 0	016 1.80	0.93 4.60	1.00	0.19	0.94 0.1	12 0.01	Zd Allowable >	Qbp < 0.1 CFS		=
	12+42.70		1.72										Blank>		driving lane that is free of water												Zd Design			
																														=
																						-								
																						1								
					1																									_

Fill in the data for the grey shaded areas only

145th Left Side - 2% Gu	tter Pan Slope	•		
	Tc = 5.0	00	Project Name: SR 523 & I-5 INTERCHANGE IMPROVEMENTS	
	C = 0.9	90	Project#: 16242	
	I = 2.3	39	S.R.: 523	
	m= 5.0	52	Designed By: JP	
	n= 0.9	53	Date: 1/5/2021	

		n=	0.5	53			Designed by	e: 1/5/2021																		
			ure not	shown			Standard curb cross section. Assumes Shor Assumes areas behind the back of curb are	reline minimum s captured separa	spacing criteria upto Sta 20+9 tely.	0 (300' from the roundabout center)																dditional structure eeded to reduce Zd
Structure ID	Dis	en pla	lth Area	ΔQ cfs (cfs)	ΣQ Slope I	L Super	T) Grate Type HM Figure 5-11	GRATE GRAWIDTH LENG	STH	Enter Requested Information		Allowable Spread Policy	Driving Sho Lane W	oulder /idth Allow (ft) Zd	vable (ft)	alculated Z _d (ft)	Depth of I Flow at Face of S Curb I d (inches)	Manning's n for Street and Pavement Gutter	Velocity Frontal fo Flow to Gutter Flow Gutter (ft/sec) Flow E _o	F	atio of rontal Flow Ratio of tercept Side FI Intercept rontal to Tot Side FI R _f R _s	of ow ted al Effiend ow of Gra	cy te Q _i Q _{bp} (cfs) (cfs)	Z _d Check	Q _{bp} Check	k Comments (L/R)
		290.00		0.513	0.513 0.08	84 0.02	20 Standard Plan B-30.30-03 Rectangular Vaned Grate	1.67 2	2.00 Interstate, Principal, Minor	Enter Speed (mph)>	25	Shoulder + 2 feet			2.00	3.79	0.91							0 Need to Decrease Zd		
	19+50.00 20+85.00	35.00 34.		0.227	0.329 0.10	0.02	20 Standard Plan B-30.30-03 Rectangular Vaned Grate	1.67 2	Arterial, or Divided 2.00 Interstate, Principal, Minor Arterial, or Divided	Enter Speed (mph)>	25	Shoulder + 2 feet	12.00	0.00	2.00	3.10	0.74	0.016	3.40 0.87	4.60	1.00	0.07 0.	88 0.29 0.0			Outside limited access area. Outside limited access area.
V		115.00		0.194	0.233 0.10	0.02	20 Standard Plan B-30.30-03 Rectangular Vaned Grate	1.67 2	2.00 Roundabouts	Applicable to all speeds, Leave Blank>		Maintain at least 10 feet of continuous driving lane that is free of water	13.12	0.00	3.12	2.72	0.65	0.016	3.12 0.92	4.60	1.00	0.08	93 0.22 0.0		>	Outside illillied access area.
1	22+00.00	95.00	.10	0.179	0.196 0.04	45 0.02	Standard Plan B-30.30-03 Rectangular Vaned Grate	1.67 2	2.00 Roundabouts	Applicable to all speeds, Leave Blank>	c	Maintain at least 10 feet of continuous driving lane that is free of water	15.57	0.00	5.57	2.96	0.71	0.016	2.22 0.89	4.60	1.00	0.14 0.	91 0.18 0.0	2 Zd Allowable > Zd Design	>	
1		103.00		0.096	0.115 0.04	41 0.02	Standard Plan B-30.30-03 Rectangular Vaned Grate	1.67 2	2.00 Roundabouts	Applicable to all speeds, Leave Blank		Maintain at least 10 feet of continuous driving lane that is free of water	15.99	0.00	5.99	2.47	0.59	0.016	1.87 0.95	4.60	1.00	0.18 0.	96 0.11 0.0	0 Zd Allowable > Zd Design	>	Curb Ramp
1	10+95.60	52.00 33.		0.087	0.092 0.04	45 0.02	Standard Plan B-30.30-03 Rectangular Vaned Grate	1.67 2	2.00 Roundabouts	Applicable to all speeds, Leave Blank		Maintain at least 10 feet of continuous driving lane that is free of water	15.53	0.00	5.53	2.23	0.54	0.016	1.83 0.97	4.60	1.00	0.18 0.	98 0.09 0.0	Zd Allowable > Zd Design	>	Curb Ramp
2		50.00		0.065	0.066 0.04	49 0.02	Standard Plan B-30.30-03 Rectangular Vaned Grate	1.67 2	1.00 Interstate, Principal, Minor Arterial, or Divided	Enter Speed (mph)>	25	Shoulder + 2 feet	12.56	0.00	2.00	1.95	0.47	0.016	1.74 0.99	4.60	1.00).19 1.	00 0.07 0.0	Zd Allowable > Zd Design	>	
2	1 12+54.20	50.00					20 Standard Plan B-30.30-03 Rectangular Vaned Grate		Arterial, or Divided	Enter Speed (mph)>		Shoulder + 2 feet			2.00	1.91							00 0.06 0.0	Zd Design		
2	13+05.30	50.00	.58	0.063	0.063 0.04	49 0.02	20 Standard Plan B-30.30-03 Rectangular Vaned Grate	1.67 2	2.00 Interstate, Principal, Minor Arterial, or Divided	Enter Speed (mph)>	25	Shoulder + 2 feet	12.00	0.00	2.00	1.92	0.46	0.016	1.72 1.00	4.60	1.00	0.20 1.	00 0.06 0.0	Zd Allowable > Zd Design	> Qbp < 0.1 CF	S
																						T				

Fill in the data for the grey shaded areas only

2019 INLET SPACING - CURB AND GO
145th Left Side (east to 5th) - 2% Gutter Pan Slope
TC = 5.00
C = 0.90
I = 2.39
m= 5.62
n= 0.53

Project Name: SR 523 & I-5 INTERCHANGE IMPROVEMENTS
Project #: 16242
S.R.: 523
Designed By: JP
Date: ########

Structure ID	Station (f	ance Width	Area (ft2)	Δ Q cfs (cfs)	ΣQ S	Slope L S	super T (ft/ft) Grate Type HM Fig	ure 5-11	GRATE WIDTH LENGTH (ft)	Roadway Classification	Enter Requested Information	Allowable Spread Policy	Driving S Lane Width (ft)	houlder Width (ft)	Allowable Zd (ft)	Calculatec Z _d (ft)	Depth of Flow at Face of Curb d (inches)	Manning's n for Street and Pavement Gutter	Velocity Frontal fo Gutter Flow Gutter (ft/sec) Flow E _o		Ratio of Frontal Flow Ratin ntercept d to Full Interc Frontal Flow R _f F	io of Flow cepted Total E Flow	ffiency Grate Q _i Q _{bp} E (cfs) (cfs)	Z _d Check	Q _{bp} Check	Comments (L/R)
	32+80.00	31.00			0.00	0.045	0.020 Standard Plan B-40.40-02 Frame a		4.07	Roundabouts	A Control of the cont	 Maintain at least 10 feet of continuous				1.92							1.00 0.06 0.0			
52	32+49.00	39.85					Grates for Grate Inlet		1.67 2.00	Roundabouts	Applicable to all speeds, Leave Blank>	Maintain at least 10 feet of continuous driving lane that is free of water												Zd Design		Outside limited access area
53	13	37.60		0.27	0.27	0.032	0.020 Standard Plan B-40.40-02 Frame a	and Dual Vaned	1.67 2.00	Roundabouts	Applicable to all speeds, Leave	Maintain at least 10 feet of continuous	12.00	0.00	2.00	3.59	9 0.86	0.016	2.11 0.81	4.75	1.00	0.15	0.84 0.23 0.0)4 Need to		Outside minited decept and
	04:44.40	40.00					Grates for Grate Inlet				Blank>	driving lane that is free of water												Decrease Zo		
54	31+11.40	40.09	,	0.02	0.06	0.029	0.020 Standard Plan B-40.40-02 Frame a	and Dual Vaned	1.67 2.00	Roundabouts	Applicable to all speeds, Leave	Maintain at least 10 feet of continuous	12.00	0.00	2.00	2.13	3 0.51	0.016	1.43 0.98	4.75	1.00	0.26	0.99 0.06 0.0	0 Need to	\	Limited by existing road geometry
	31+00.10	37.82	2				Grates for Grate Inlet				Blank>	driving lane that is free of water												Decrease Zd		Limited available ROW and upstream inlet is 10' away
55	30+59.20	10.90 39.46	6	0.08	0.08	0.019	0.020 Standard Plan B-40.40-02 Frame a Grates for Grate Inlet	and Dual Vaned	1.67 2.00	Roundabouts	Applicable to all speeds, Leave Blank>	Maintain at least 10 feet of continuous driving lane that is free of water	13.61	0.00	3.61	2.50	0.60	0.016	1.28 0.95	4.75	1.00	0.30	0.96 0.08 0.0	00 Zd Allowable > Zd Design	Qbp 0.1 CFS	
																									\	
																										additional structure or
																										deviation needed for
																										not meeting Zd
																-	+									
																-	+									
																	+									
																-	+									
																	+									
												L					1								<u> </u>	

Fill in the data for the grey shaded areas only

Project Name: SR 523 & I-5 INTERCHANGE IMPROVEMENTS
Project #: 16242
S.R.: 523
Designed By: JP
Date: #######

																																			7
Structure ID Station		Width A	rea Δ ft2)	Q cfs (cfs)	Σ Q Slope L Supe (cfs) (ft/ft) (ft/ft	er T (ft)	Grate Type	HM Figure	5-11	GRATE GRAT WIDTH LENG (ft) (ft)	TH	ay Classification	Enter Requ	ested Information	Allow	vable Spread Policy	Driv La Widtl	ing Shoulde ne Width n (ft) (ft)	er Allowab Zd (ft)	le Calculat	Depth Flow Face ted Curt d (inch	m of Mannin y at n for tof Street a b Pavementes) Gutte	g's Velocity fo and Gutter Flow (ft/sec)	Ratio of Frontal Flow to Total Gutter Flow E _o	Splash-Over ed to Velocity Vo (ft/sec)	io of ontal ow Ratio rcept Side F o Full Interce ontal to To ow Side F R _f R _s	of flow pted tal Effienc flow of Grat	cy te Q _i (cfs)	$\begin{array}{c} Q_{bp} \\ (cfs) \end{array} Z_d$	Check Q _{bp} C	Check		Comments (L/R)		
43+68.0 57	48.00			0.07	0.07 0.043 0.	.020 Standa	ard Plan B-25.20-	-02 Combination	n Inlet	3.00 1.	00 Roundab	outs	Applicable to a	all speeds, Leave	 Maintain at I driving lane t	least 10 feet of conti that is free of water	nuous 1	2.32 0.0	00 2.	32 1.	.98 (0.48 0.0	1.65	1.00	4.60	1.00	0.05 1.0	00 0.07	7 0.00 Zd All Zd De	owable >					
43+20.0 58	50.00	27.53		0.06	0.06 0.049 0.	1.020 Standa	ard Plan B-25.20-	-02 Combination	n Inlet	3.00 1.	00 Roundab	outs	Applicable to a	all speeds, Leave	Maintain at I	least 10 feet of conti that is free of water	nuous 1	2.00 0.0	00 2.	00 1.	.92	0.46 0.0	1.72	1.00	4.60	1.00	0.05 1.0	00 0.06	0.00 Zd All Zd De	owable >					
60 41+75.0	95.00	25.99		0.14	0.14 0.048 0.	0.020 Standa	ard Plan B-25.20-	-02 Combination	n Inlet	3.00 1.	00 Roundab	outs	Applicable to a	all speeds, Leave	Maintain at I driving lane t	least 10 feet of conti that is free of water	nuous 1	2.00 0.0	00 2.	00 2.	2.55 (0.61 0.0	116 2.07	1.00	4.60	1.00	0.03 1.0	00 0.14	0.00 Need Decre	to Qbp < 0	.1 CFS	Limit	ad by oxisting utility pale good		i
41+75.0	0	26.65																												K		LIMI	ed by existing utility pole geo	metry	Ī
																																			Ī
																																			Ī
																																\			
																																	additional		
																																	deviation r not meetin		for
																																	not meetin	y Zu	_

												STOR	RM SEWE	R DESIG	SN (Eng	lish Units)											
								Т	This sprea	adsheet	accompli	ishes a s	torm sewer des	ign using the	rational me	hod. Enter the data in t	he non-shaded areas on	ly.									
								Р	Please us	e one sp	preadshe	et per st	ormsewer run.														
Project Nar	ne: 145th W	Nest - Sou	th Side		1						1		1							+			Designed By Project Office:				
																							Froject Office	. LACET			
m = 5	.62	n =	0.53		Design	Storm Eve	vent =	10				P	evement thickne	ss (ft) =	0.75		Pipe Thickness (inches)	= 1.25		+							
													1	(11)				1.20		1 1							
Location													Discharge	Drain Design							Dr	ain Profile					Remarks
Drain Located On From Sta	To Sta		urce of Dr rainage A	ainage Runot rea A Coeff. acre)	f CA (acre)	(acre)	Area 8a + 7	Tc across	Rainfall I Intensity (in/hr)	Runoff (cfs)	Inflow (cfs)	Total Flow (cfs)	Pipe Dia. Manning (in) roughness coefficient "n"	Slope Fli (ft/ft) (ft	cw Capacity s) (cfs)	Pipe Velocity Check (Desirable Minimum 3 ft/sec; Desirable Maximum 10 ft/sec for Column	16)	13 Pipe Length*** (ft)	Elevation Change (ft	t) Invert Elev. Invert (ft)	t Elev.	Upstr. Downstr. Ground Ground ev. (ft) Elev. (ft)		Downstr. Pipe Cover (ft)	Upstr. Pipe Cover Check (ft)	Downstr. Pipe Cover Check (ft)	
1 2	3			5 6	7	8	8a	9	10	11		13			17	17a	176	18	19	20	11	22 23	24	25	26	27	24
145th West offsite	7	Park Road	ng Lot 1.6	3 0.90 2 0.90	0.19	1.47 5.0 1.66 5.0	0 5.0	2.	2.39 3 2.39 3	3.51 3.97	0.00	3.51 3.97	12 0.012 12 0.012	0.1093 16.24 0.1008 15.60	12.24	TRY TO REDUCE VELOCITY TRY TO REDUCE VELOCITY	ADEQUATE PIPE CAPACITY ADEQUATE PIPE CAPACITY	16.1	1.76	370.00 368. 368.24 355	24 38 31 37	0.00 371.74 1 74 359.16	8.15 1.65	1.65	More than 2 ft of cover Low Cover - See Notes at Bottom	Low Cover - See Notes at Bottom More than 2 ft of cover	Existing pipe inlet Upstream end matches existing and is under sidewalk
7	8	Road	0.1	1 0.90	0.10	1.76 5.0	0 5.2	2.	2.36 4	4.15	0.00	4.15	12 0.012	0.1003 15.56 0.1016 15.66	12.21	TRY TO REDUCE VELOCITY	ADEQUATE PIPE CAPACITY	66.8	6.70	355.31 348.	31 35	9.16 352.46	2.00	2.00	More than 2 ft of cover	More than 2 ft of cover	operiodin one materios existing and to ander oldertain
8	9	Road	0.0	6 0.90 4 0.90	0.05	1.81 5.0 1.85 5.0	0 5.2		2.34 4 2.33 4	4.23 4.30	0.00	4.23	12 0.012	0.1016 15.66	12.29	TRY TO REDUCE VELOCITY	ADEQUATE PIPE CAPACITY	51.4	5.22	348.61 343.	39 35	2.46 347.24	2.00	2.00	More than 2 ft of cover More than 2 ft of cover	More than 2 ft of cover	
10	12	Road		9 0.90		1.85 5.0				4.30 4.46	0.00	4.46	12 0.012 12 0.012	0.0800 13.90 0.0299 8.49		VELOCITY OK	ADEQUATE PIPE CAPACITY	1105 9	3 17	1337 10 1333	a3 134	n 95 1337 n3	2.00	1.25	More than 2 ft of cover More than 2 ft of cover	More than 2 ft of cover Low Cover - See Notes at Bottom	Downstream end outside driveable area
12	80	Road	0.0	0.90	0.07	2.00 5.0	0 5.6	2.	2.26 4	4.53	0.00	4.53	18 0.012	0.0053 4.69	8.28	VELOCITY OK	ADEQUATE PIPE CAPACITY	67.8	0.36	333.43 333.	07 33	7.03 337.85	1.25	2.43	Low Cover - See Notes at Bottom	More than 2 ft of cover	Outside driveable area
80	SWALE	Road	0.4	0.90	0.43	2.43 5.0	0 5.8	2.	2.21 5	5.37	0.00	5.37	18 0.012	0.0051 4.60	8.12	VELOCITY OK	ADEQUATE PIPE CAPACITY	33.3	0.17	333.07 332.	90 33	37.85 331.90	2.43	-3.35	More than 2 ft of cover	Not Enough Cover - Need to Revise Pipe Elevations	Outlet to swale
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16	15	Road		0.90		0.08 5.0		2.	2.39 0				12 0.012	0.0050 3.47	2.73	VELOCITY OK	ADEQUATE PIPE CAPACITY		0.37	330.10 329.				4.32	More than 2 ft of cover	More than 2 ft of cover	
15	14	Road		7 0.90 3 0.90					2.31 0	0.32	0.00	0.32	12 0.012	0.0050 3.47 0.0050 3.47	2.73	VELOCITY OK VELOCITY OK	ADEQUATE PIPE CAPACITY ADEQUATE PIPE CAPACITY	68.3	0.34	329.73 329.	39 33	5.91 337.35	4.32	6.11	More than 2 ft of cover More than 2 ft of cover	More than 2 ft of cover More than 2 ft of cover	
65	SWALE	Road	0.0	3 0.90 B 0.90	0.12	0.26 5.0	0 6.3	2.	2.24 0	0.70	0.00	0.56	12 0.012 12 0.012	0.0050 3.47	2.73	VELOCITY OK	ADEQUATE PIPE CAPACITY	79.8	0.40	328.79 328.	39 33	12.94	2.30	2.30 -330.24	More than 2 ft of cover	Not Enough Cover - Need to Revise Pipe Elevations	Outlet to swale
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The spre	adsheet will	ill only cal	culate one	torm sewe	r line at a	time. Plea	ase copy t	the "Blani	ık Templa	ate" and	use this	for calcu	lating new storr	n sewer lines						+ +						-	
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model th	e conveyan	nce syster	n. Please c	ontact your	Region H	lydraulics	Engineer.																				
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145th West-South

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2	3	4			8 8a	9	10	11	12 13		14a				17a	176	18		20	21	22		24 25	26	27	24
st 1	2	Road Road	0.00 0.90			0.0	2.39	0.00	0.00 0.00 0.00 0.67	12	0.012		10.73 15.35		RY TO REDUCE VELOCITY RY TO REDUCE VELOCITY		248		379.80					More than 2 ft of cover	More than 2 ft of cover More than 2 ft of cover	
3	4	Road	0.31 0.90 0.17 0.90			5.1	2.39		0.00 0.67			0.1006			RY TO REDUCE VELOCITY		112.5		367.98 354.80					More than 2 ft of cover More than 2 ft of cover	More than 2 ft of cover	
4	VAULT	Road	0.14 0.90			5.3	2.33		0.00 1.29					3.86 VI		ADEQUATE PIPE CAPACITY	35.5	0.36	343.48	43.13 3	7.48 3	350.85	2.15 5.87	More than 2 ft of cover	More than 2 ft of cover	
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17	18	Road	0.11 0.90	0.10	0.10 5.0	5.0	2.39	0.23	0.00 0.23	12	0.012	0.0699	12.99	10.19 Ti	RY TO REDUCE VELOCITY	ADEQUATE PIPE CAPACITY	98.9	6.91	336.91	30.00 3	0.91 3	337.74 2	2.15 5.89	More than 2 ft of cover	More than 2 ft of cover	
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25	24	Road	0.12 0.90	0.11	0.11 5.0	5.0	2.39	0.27	0.00 0.27	12	0.012	0.0060	0.04	200	YELOCITY OK	ADEQUATE PIPE CAPACITY	40.6	0.30	331.05	20.75	E E 4 2	26.46	2.64	More than 2 ft of cover	More than 2 ft of cover	
25	24	Road	0.00 0.90			5.2	2.39	0.27	0.00 0.27	12	0.012	0.0060			ELOCITY OK	ADEQUATE PIPE CAPACITY ADEQUATE PIPE CAPACITY	71.9							More than 2 ft of cover	More than 2 ft of cover	
23	18	Road	0.12 0.90	0.11	0.22 5.0	5.5	2.27	0.50	0.00 0.50	12	0.012	0.0127			ELOCITY OK	ADEQUATE PIPE CAPACITY	25.3	0.32	330.32	30.00 3	7.68 3	337.74	5.50 5.89	More than 2 ft of cover	More than 2 ft of cover	
18	19	Road	0.18 0.90	0.16	0.16 5.0	5.0	2.39	0.39	0.73 1.13	12	0.012	0.0450	10 42	8 18 TI	RY TO REDUCE VELOCITY	ADEQUATE PIPE CAPACITY	52.2	2.35	332 94	30.59	7.74 3	35 39 2	2 95 2 95	More than 2 ft of cover	More than 2 ft of cover	
9	20	Road	0.06 0.90	0.06	0.22 5.0	5.1	2.37		0.00 1.25			0.0339	9.04	7.10 VI	ELOCITY OK	ADEQUATE PIPE CAPACITY	50.2	1.70	330.59	28.89 3	5.39 3	332.89	2.95 2.15	More than 2 ft of cover	More than 2 ft of cover	
20	21	Road	0.03 0.90	0.03	0.25 5.0	5.2	2.35	0.59	0.00 1.32	12	0.012	0.0365			ELOCITY OK	ADEQUATE PIPE CAPACITY	50.1	1.83	328.89	27.06 3	2.89 3	330.43	2.15 1.52	More than 2 ft of cover	Low Cover - See Notes at Bottom	Downstream is outside driveable area
21	SWALE	Road	0.03 0.90	0.03	0.28 5.0	5.3	2.33	0.64	0.00 1.37	12	0.012	0.0100	1.92	3.86 VI	ELOCITY OK	ADEQUATE PIPE CAPACITY	45.8	0.46	327.06	26.60 3	0.43 3	326.60	1.52 -1.85	Low Cover - See Notes at Bottom	Not Enough Cover - Need to Revise Pipe Elevations	s Outlet to swale
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Place of the property Plac									This	spreadshe	eet accor	mplishes a	storm sewer de	esian usi	ng the rat	onal method. Enter the data in t	ne non-shaded areas o	nlv.										
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	Project Nam	ne: 145th Eas	st - Both S	Sides			•	•	•					•										Designed By	r: JP			
Annual Control Annu																												
### 15																												
Second S	m = 5.0	i.62 r	n =	0.53		Design Sto	orm Event	t =	10				Pavement thickr	ness (ft) =	0.7	F	pipe Thickness (inches)	= 1.2	5									
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## 15 25 No. 10 10 10 10 10 10 10 1	d On From Sta.	. To Sta.	Sour Drai	inage Area A	Coeff. C	CA (acre) Sum (a	r CA T _c Acro	tes) pipe len	ncross Inten	nfall Runoff nsity (hr)	(cfs) Conti Inflo (cfs	rib. Total Flow ow (cfs) s)	(in) roughnes coefficier	Pipe is Slope nt (ft/ft)	Velocity Of Flow (ft/s)	Capacity Minimum 3 ft/sec; Desirable	vs. Column 17)	13 Pipe Length*** (ft)	Change	ge (ft) Invert Ele (ft)	Downstr. Invert Elev. (ft)	Upstr. Ground Elev. (ft)	Downstr. Ground Elev. (ft)	Upstr. Pipe Cover (ft)	Downstr. Pipe Cover	(ft) Upstr. Pipe Cover Check (ft)	Downstr. Pipe Cover Check (ft)	
## 15 Mary 15	2	3	-			7 .	8 8a	9											19	9 20	21	22	23	24	25	26	27	24
Column C	52	53	Road	0.35	0.90	0.31 0.3	1 5.0	5.0	2.39	0.75	0.00	0.75				7.62 VELOCITY OK		137.9	5.38	324.17	318.79	328.17	322.31	2.15	1.67	More than 2 ft of cover	Low Cover - See Notes at Bottom	
LOW COVER FOR LANGE 1, 20 1, 2	53	55		0.15	0.90	0.14 0.43	7 5.0	5.2	2.34	1.06	0.00	1.06	12 0.012	0.0044	3.25	2.55 VELOCITY OK			0.05	318.79	318.74	322.31	322.00	1.67	2.08			
Company Comp	55	48		0.16	0.90	0.14 0.6	1 5.0	5.5	2.28	1.40	0.00	1.40	12 0.012	0.0051	3.49	2.74 VELOCITY OK			0.27	318.53	318.26	322.46	321.00	2.08	0.89			
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## 1	42	43	Road	0.30	0.90	0.27 0.23	7 5.0	5.0	2.39	0.65	0.00	0.65	12 0.012	0.0203	7.00	5.49 VELOCITY OK	ADEQUATE PIPE CAPACITY	33	0.67	318.02	317.35	321.10	319.94	1 23	0.74	Low Cover - See Notes at Bottom	Low Cover - See Notes at Bottom	TO, 00 & 0T
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Column C		45	D	0.40	0.00	0.00		5.0	0.00	0.00	0.00	0.00	40 0.040	0.0400	0.00	7.74	ADEQUATE DIDE CADACITY	445.0	4.04	000.44	040.50	007.44	000.07	0.45	4.00	M - 1 - 00 - 6		Diameter in the state of the st
## 1	44	45		0.10				5.0		0.20	0.00	0.20	12 0.012					10.1	0.05	323.14	318.53	327.14	322.37	2.15	1.99			
## 15 Processes 15	46	47						5.2									ADEQUATE PIPE CAPACITY							1.73	1.30			
49	47	48						5.3								2.63 VELOCITY OK	ADEQUATE PIPE CAPACITY	23.6	0.11	318.37	318.26	321.52	321.00	1.30	0.89	Low Cover - See Notes at Bottom	Low Cover - See Notes at Bottom	Pipe run under sidewalk
1	48	49						5.5	2.29	0.45	1.40									317.76	317.67	321.00	320.71	0.89	0.68	Low Cover - See Notes at Bottom	Low Cover - See Notes at Bottom	
1	49	50						5.5												317.67	317.54	320.71	320.44	0.68	0.55			
Highlighted numbers do not match the profiles. SDOT Hydrallic Manual 6-5 for explanation of columns. https://www.wsdot.wa.gov/Publications/Manuals/M23-03.htm dates was used as the five wint to the being analyzed. Column 12 represents inflow from a storm sever runs the law paths and the paths are supposed in the five wint and the paths are supposed in the five wint winter the five wint of the law paths are supposed in the throw enter the server such paths are supposed in the throw enter the server such paths are supposed in the five winter the server such paths are supposed in the five winter the server (five five five five five five five five	50	51		0.02				5.6			0.00	1.93					ADEQUATE PIPE CAPACITY	37.7	0.19	317.54	317.35	320.44	320.46	0.55	0.75	Low Cover - See Notes at Bottom		
Highlighted numbers do not match the profiles. SDOT Hydraulic Manual 6-5 for explanation of columns. https://www.wsdot.wa.gov/Publications/Manuals/M23-03.htm without a summarise response re	43	SWALE		0.13				5.8	2.22	1.01	0.03	3.05	18 0.012				ADEQUATE PIPE CAPACITY	46.4	0.33	317.00	316.77	319.94	316.93	0.75	-2.19	Low Cover - See Notes at Bottom	Not Fnough Cover - Need to Revise Pipe Flevations	s Pine outlet to swale
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12/9/2021 2:41 PM 3 of 3

145th East

Mitigated Routing

Vault 1

 Width:
 7 ft.

 Length:
 75 ft.

 Depth:
 5 ft.

Discharge Structure Riser Height: 4 ft.

Riser Diameter: 18 in.
Notch Type: Rectangular
Notch Width: 0.051 ft.
Notch Height: 2.856 ft.

Orifice 1 Diameter: 3.25 in. Elevation:0 ft.

Element Flows To:

Outlet 1 Outlet 2

Vault Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	
0.0000	0.012	0.000	0.000	0.000
0.0556	0.012	0.000	0.067	0.000
0.1111	0.012	0.001	0.095	0.000
0.1667	0.012	0.002	0.117	0.000
0.2222	0.012	0.002	0.135	0.000
0.2778	0.012	0.003	0.151	0.000
0.3333	0.012	0.004	0.165	0.000
0.3889	0.012	0.004	0.178	0.000
0.4444	0.012	0.005	0.191	0.000
0.5000	0.012	0.006	0.202	0.000
0.5556	0.012	0.006	0.213	0.000
0.6111	0.012	0.007	0.224	0.000
0.6667	0.012	0.008	0.234	0.000
0.7222	0.012	0.008	0.243	0.000
0.7778	0.012	0.009	0.252	0.000
0.8333	0.012	0.010	0.261	0.000
0.8889	0.012	0.010	0.270	0.000
0.9444	0.012	0.011	0.278	0.000
1.0000	0.012	0.012	0.286	0.000
1.0556	0.012	0.012	0.294	0.000
1.1111	0.012	0.013	0.302	0.000
1.1667	0.012	0.014	0.310	0.000
1.2222	0.012	0.014	0.320	0.000
1.2778	0.012	0.015	0.332	0.000
1.3333	0.012	0.016	0.344	0.000
1.3889	0.012	0.016	0.357	0.000
1.4444	0.012	0.017	0.370	0.000
1.5000	0.012	0.018	0.384	0.000
1.5556	0.012	0.018	0.398	0.000
1.6111	0.012	0.019	0.413	0.000
1.6667	0.012	0.020	0.427	0.000
1.7222	0.012	0.020	0.442	0.000
1.7778	0.012	0.021	0.457	0.000
1.8333	0.012	0.022	0.472	0.000
1.8889	0.012	0.022	0.486	0.000
1.9444	0.012	0.023	0.501	0.000
2.0000	0.012	0.024	0.516	0.000

Does not match vault

details in the plans.